

Reference Guide

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Alarm Condition Configuration

Bristol OpenEnterprise Reference Guide

Alarm Condition Configuration

Contents

1 Alarm Condition Tool	6
1.1 Alarm Condition Tables.....	6
1.2 Alarm Condition Configuration	6
1.3 Alarm Condition Elements.....	6
1.4 Alarm Condition Lookup Table.....	6
2 Alarm Condition Tables.....	10
2.1 abdevicehealthalarmcondition	10
2.2 alarminhibitalarmcondition	11
2.3 alarminhibitstatealarmcondition	11
2.4 calculationstatusalarmcondition	11
2.5 digitalalarmcondition	11
2.6 digitalchangetonullalarmcondition.....	11
2.7 digitaldelayalarmcondition.....	11
2.8 digitalstatealarmcondition.....	12
2.9 integeranalogalarmcondition	12
2.10 integeranalogchangetonullalarmcondition	12
2.11 integeranalogchangeofvaluealarmcondition	12
2.12 integeranalogdeviationalarmcondition	12
2.13 integeranalogequalsalarmcondition.....	12
2.14 integeranaloglimitalarmcondition	13
2.15 integeranalograteofchangealarmcondition	13
2.16 integeranalogsignalalarmcondition	13
2.17 journalalarmcondition.....	14
2.18 journalequalalarmcondition.....	14
2.19 journalrangealarmcondition	14
2.20 multistatedigitalalarmcondition	14
2.21 notesalarmcondition.....	14
2.22 nw3000devicecommunicationalarmcondition	14
2.23 nw3000devicestatusalarmcondition.....	15
2.24 nw3000deviceversionalarmcondition.....	15
2.25 nw3000digitalalarmcondition	15
2.26 nw3000questionablealarmcondition	15
2.27 nw3000realanalogalarmcondition	15
2.28 oeprinteralarmcondition	15
2.29 oeprintergroupalarmcondition	16
2.30 questionablealarmcondition	16
2.31 questionableequalsalarmcondition	16
2.32 questionablerangealarmcondition.....	16
2.33 realanalogalarmcondition.....	16
2.34 realanalogchangeofvaluealarmcondition	16
2.35 realanalogchangetonullalarmcondition	16
2.36 realanalogdeviationalarmcondition	17

- 2.37 realanalogequalsalarmcondition 17
- 2.38 realanaloglimitalarmcondition 17
- 2.39 realanalograteofchangealarmcondition 17
- 2.40 realanalogsignalalarmcondition 18
- 2.41 redundancyalarmcondition 18

- 3 Alarm Condition Configuration 19**
 - 3.1 Alarm Condition Table Drop Down List 19
 - 3.2 Filter Grid Entry 20
 - 3.3 Filtering with Wildcards 20
 - 3.4 Refresh Button 21
 - 3.5 Options Button 21
 - 3.6 Options 21
 - 3.6.1 Number of Objects to Retrieve Field 21
 - 3.6.2 Prompt for Filter Check Box 21
 - 3.7 Next 100 Button 21
 - 3.8 Alarm Condition List 21
 - 3.9 Add Button 22
 - 3.10 Delete Alarm Condition Button 22
 - 3.11 Modifying Alarm Conditions 22
 - 3.12 Help Button 22
 - 3.13 Close Button 22

- 4 Add/Modify Alarm Condition 23**
 - 4.1 Priority 23
 - 4.2 Precedence 23
 - 4.3 Suppress 24
 - 4.4 Suppression Groups 24
 - 4.5 Alarm Redirection Button 24
 - 4.6 Help Text 24
 - 4.7 Condition Field 24
 - 4.8 Signal 24
 - 4.9 Limit Field 24
 - 4.10 Dead Band In Field 24
 - 4.11 Dead Band Out Field 25
 - 4.12 Questionable Mask 25
 - 4.12.1 Bit Settings 26
 - 4.12.2 Questionable in Device 26
 - 4.12.3 Data Collection Failure 27
 - 4.12.4 Device Offline 27
 - 4.12.5 Not a Number 27
 - 4.12.6 OK Button 27
 - 4.12.7 Cancel Button 27
 - 4.13 Suppression Group Association 27
 - 4.13.1 Available Suppression Groups 27
 - 4.13.2 Add Suppression Group Button 28

- 4.13.3 Remove Suppression Group Button 28
- 4.13.4 Associated Suppression Groups 28
- 4.13.5 OK Button 28
- 4.13.6 Cancel Button 28
- 4.14 Alarm Redirection 28
 - 4.14.1 Title Bar 29
 - 4.14.2 Alarm Redirections 29
 - 4.14.3 Add button 29
 - 4.14.4 Alarm Redirection Properties 29
 - 4.14.4.1 Alarm Redirection Description 29
 - 4.14.4.2 Wait for 30
 - 4.14.4.3 Set Priority Check 30
 - 4.14.4.4 Set Priority to 30
 - 4.14.4.5 Set Priority if current lower 30
 - 4.14.4.6 Always 30
 - 4.14.4.7 Set Plant Area Check 30
 - 4.14.4.8 Plant Areas 30
 - 4.14.4.9 Set Access Area Check 30
 - 4.14.4.10 Access Areas 30
 - 4.14.4.11 Set Occurrence Time Check 30
 - 4.14.4.12 Set Digital Signal Check 30
 - 4.14.4.13 Set Digital Name 31
 - 4.14.4.14 Browse for Digital Signal 31
 - 4.14.4.14.1 Browse for Signal Filter Grid 31
 - 4.14.4.14.2 Browse for Signal Refresh Button 31
 - 4.14.4.14.3 Browse for Signal Options Button 32
 - 4.14.4.14.4 Options Dialog 32
 - 4.14.4.14.4.1 Browse for Signal Filter Prompt 32
 - 4.14.4.14.4.2 Browse for Signal Number of Objects 32
 - 4.14.4.14.5 Browse for Signal Next Button 32
 - 4.14.4.14.6 Signal List 32
 - 4.14.4.14.7 Browse for Signal OK Button 32
 - 4.14.4.15 Alarm Redirection Properties OK button 32
 - 4.14.4.16 Alarm Redirection Properties Cancel button 33
 - 4.14.5 Alarm Redirection Insert button 33
 - 4.14.6 Alarm Redirection Modify button 33
 - 4.14.7 Alarm Redirection Delete Button 33
 - 4.14.8 Alarm Redirection Delete All button 33
 - 4.14.9 Alarm Redirection Close button 33
- 4.15 Sound Configuration 33
 - 4.15.1 Sound File 34
 - 4.15.2 Play Sound Number of Times 34
 - 4.15.3 Sound Configuration Example 34
- 4.16 Browse For Signal 35
 - 4.16.1 Browse for Signal Filter Grid 36
 - 4.16.2 Browse for Signal Refresh Button 36

4.16.3	Browse for Signal Options Button	36
4.16.4	Options	37
4.16.4.1	Browse for Signal Filter Prompt	37
4.16.4.2	Browse for Signal Number of Objects	37
4.16.5	Signal List.....	37
4.16.6	Browse for Signal Next Button	37
4.16.7	Browse for Signal OK Button	37
5	Glossary	38
6	Index	39

1 Alarm Condition Tool

The Alarm Conditions configuration tool enables you to create local OpenEnterprise alarm conditions. OpenEnterprise alarm conditions are objects which cause alarms when the conditions are met. For instance, a Tank level which could be dangerous if it gets too high could be configured as an alarm condition. The alarm condition for this would reference the originating object (in this case the specific Tank's level sensor), and a value for that object which would cause an alarm to be generated.

OpenEnterprise supports remote alarm generation for Bristol RTUs. Local alarm conditions are configured and generated solely within OpenEnterprise, whereas remote alarm conditions are initially configured and generated within the RTU. When the signals are built into the database using the NW3000 Database Builder, it creates the necessary alarm conditions also, according to the ACCOL or other control language operating within the RTU. When the RTU goes online, any alarms are reported to OpenEnterprise, which generates the alarms in the database. Note that since the NW3000 Database Builder creates alarm conditions for Bristol RTUs during the database build process, the Alarm Condition Configuration Tool should not be used to create or modify remote alarm conditions for Bristol RTUs.

1.1 Alarm Condition Tables

To create an alarm for a signal or any object, it must be referenced by an alarm condition object in one of the Alarm Condition tables provided within the OpenEnterprise database.

The name of the Alarm Condition table provides a clue to the signal or object types on which the alarm condition should be applied. For instance, the `realanaloglimitalarmcondition` table enables you to create alarms for any realanalog signal based on six value limits (low range, lowlow, low, high, highhigh and high range).

1.2 Alarm Condition Configuration

All Alarm Condition Configuration, including the selection of the Alarm Condition Table is done from the main Alarm Condition Configuration Dialog, which opens when the Alarm Conditions Tool is selected from the Toolbox.

1.3 Alarm Condition Elements

An alarm condition must have the following properties defined: -

1. A unique id.
2. An object to which it relates (e.g. a signal).
3. An alarm condition type (e.g. high, change of state). Alarm Condition type codes and their explanation are stored in the Alarm Condition Lookup table.
4. For certain types of alarm, a user defined value or range of values which causes the alarm condition to raise an alarm (e.g. 75, 95, Bit 0, 1-7)

1.4 Alarm Condition Lookup Table

The AlarmConditionLookup table contains the ID number and description of all available alarm condition types. Each alarm condition object must have an alarm condition type. Below is a list, showing the alarm condition type's ID number, it's description and the tables using that alarm condition type.

Reference Guide

D301469X412

23-Mar-2010 - Page 7

Alarm Condition Configuration

ID	Alarm Condition Description	Alarm Condition Table
1	High Range	RealAnalogLimit, IntegerAnalogLimit
2	High High	RealAnalogLimit, IntegerAnalogLimit
3	High	RealAnalogLimit, IntegerAnalogLimit
4	Low	RealAnalogLimit, IntegerAnalogLimit
5	Low Low	RealAnalogLimit, IntegerAnalogLimit
6	Low Range	RealAnalogLimit, IntegerAnalogLimit
7	Change to True	DigitalState
8	Change to False	DigitalState
9	Change of State	DigitalState
10	Delayed On	DigitalDelay
11	Delayed Off	DigitalDelay
12	Deviation	RealAnalogDeviation, IntegerAnalogDeviation
13	Rate of Change	RealAnalogRateofChange, IntegerAnalogRateofChange
14	Greater Than or Equals	RealAnalogEquals, IntegerAnalogEquals
15	Greater Than	RealAnalogEquals, IntegerAnalogEquals
16	Equals	RealAnalogEquals, IntegerAnalogEquals
17	Less Than	RealAnalogEquals, IntegerAnalogEquals
18	Less Than or Equals	RealAnalogEquals, IntegerAnalogEquals
19	Change to Null	RealAnalogChangetoNull, IntegerAnalogChangetoNull
20	Multi State Digital	MultistateDigital
21	Journal Message	JournalEqual, JournalRange
22	Questionable Range	QuestionableRange
23	Questionable Equals	QuestionableEquals
24	Questionable (NW3000)	NW3000Questionable
25	Communication Failure	NW3000DeviceCommunication
26	Run SQL Script Error	RunSQLScriptErrorAlarmcondition
27	Trigger SQL Procedure Error	TriggerSQLProcedureAlarmcondition
28	Reporting Equals	ReportEqualsAlarmcondition
29	Reporting Range	ReportRangeAlarmcondition
31	Undefined ROC Alarm	RocPointAlarmcondition
32	Low Alarm	RocPointAlarmcondition
33	Low Low Alarm	RocPointAlarmcondition
34	High Alarm	RocPointAlarmcondition
35	High High Alarm	RocPointAlarmcondition
36	Rate Alarm	RocPointAlarmcondition
37	Status Change	RocPointAlarmcondition

Reference Guide

D301469X412

23-Mar-2010 - Page 8

Alarm Condition Configuration

38	Point Fail	RocPointAlarmcondition
39	Scanning Disabled	RocPointAlarmcondition
40	Scanning Manual	RocPointAlarmcondition
41	Redundant Total Counts	RocPointAlarmcondition
42	Redundant Flow Register	RocPointAlarmcondition
43	No Flow Alarm	RocPointAlarmcondition
44	Input Freeze Mode	RocPointAlarmcondition
45	Sensor Communication Failure	RocPointAlarmcondition
46	485 Communication Failure	RocPointAlarmcondition
47	Off Scan Mode	RocPointAlarmcondition
48	Manual Flow Inputs	RocPointAlarmcondition
49	Z Calc Alarm	RocPointAlarmcondition
50	Temp Fail Alarm	RocPointAlarmcondition
51	Sequence Out of Order	RocPointAlarmcondition
52	Phase Discrepancy	RocPointAlarmcondition
53	Pulse Synchronization Failure	RocPointAlarmcondition
54	Frequency Discrepancy	RocPointAlarmcondition
55	Pulse Input 1 Failure	RocPointAlarmcondition
56	Pulse Input 2 Failure	RocPointAlarmcondition
57	Pulse Output Buffer Overrun	RocPointAlarmcondition
58	Pulse Output Buffer Warning	RocPointAlarmcondition
59	Relay Fault	RocPointAlarmcondition
60	Relay Failure	RocPointAlarmcondition
61	FST Alarm	RocPointAlarmcondition
62	User Text Alarm	RocPointAlarmcondition
63	User Value Alarm	RocPointAlarmcondition
64	PT Low Alarm	RocPointAlarmcondition
65	PT High Alarm	RocPointAlarmcondition
66	PT Point Fail	RocPointAlarmcondition
67	AP Low Alarm	RocPointAlarmcondition
68	AP High Alarm	RocPointAlarmcondition
69	AP Point Fail	RocPointAlarmcondition
70	DP Low Alarm	RocPointAlarmcondition
71	DP High Alarm	RocPointAlarmcondition
72	DP Point Fail	RocPointAlarmcondition
73	SP Low Alarm	RocPointAlarmcondition
74	SP High Alarm	RocPointAlarmcondition
75	SP Point Fail	RocPointAlarmcondition

76	TMP Low Alarm	RocPointAlarmcondition
77	TMP High Alarm	RocPointAlarmcondition
78	TMP Point Fail	RocPointAlarmcondition
79	TDI Low Alarm	RocPointAlarmcondition
80	TDI Low Low Alarm	RocPointAlarmcondition
81	TDI High Alarm	RocPointAlarmcondition
82	TDI High High Alarm	RocPointAlarmcondition
83	TDI Rate Alarm	RocPointAlarmcondition
84	Channel A Failure	RocPointAlarmcondition
85	Channel B Failure	RocPointAlarmcondition

The entries within this table should not be modified. If they are, then the effect on the OpenEnterprise alarm system is undefined.

2 Alarm Condition Tables

The table names shown below are the Alarm Condition tables as displayed within the Alarm Condition drop-down list on the Alarm Condition Tool's Main Dialog. All are derived from the AlarmCondition table.

Each of the alarm condition tables can contain one or more actual alarm conditions. Each alarm condition relates to a single signal. Many alarm conditions also require a specific value that raises the alarm, although some, like the *integer* and *realanalogchangevalue* alarm conditions raise an alarm if the signal's value just changes.

The type of the alarm conditions stored in each table is indicated by the name of the table. Most alarm condition tables contain one alarm condition type, but others may contain more than one alarm condition type. For instance, the *realanaloglimitalarmcondition* table can contain 6 alarm condition types (High Range, HiHi, Hi, Lo, LoLo and Low Range). A list of available alarm types is stored in the Alarm Condition Lookup table.

abdevicehealthalarmcondition alarminhibitalarmcondition alarminhibitstatealarmcondition calculationstatusalarmcondition digitalalarmcondition digitalchangetonullalarmcondition digitaldelayalarmcondition digitalstatealarmcondition integeranalogalarmcondition integeranalogchangetonullalarmcondition integeranalogchangevaluealarmcondition integeranalogdeviationalarmcondition integeranalogequalsalarmcondition integeranaloglimitalarmcondition integeranalograteofchangealarmcondition integeranalogsignalalarmcondition journalalarmcondition journaequalalarmcondition journalrangealarmcondition multistatedigitalalarmcondition notesalarmcondition nw3000devicecommunicationalarmcondition nw3000devicestatusalarmcondition nw3000deviceversionalarmcondition	nw3000digitalalarmcondition nw3000questionablealarmcondition nw3000realanalogalarmcondition oeprinteralarmcondition oeprintergroupalarmcondition questionablealarmcondition questionableequalsalarmcondition questionablerangealarmcondition realanalogalarmcondition realanalogchangetonullalarmcondition realanalogchangeofvaluealarmcondition realanalogdeviationalarmcondition realanalogequalsalarmcondition realanaloglimitalarmcondition realanalograteofchangealarmcondition realanalogsignalalarmcondition redundancyalarmconditiona redundancyalarmconditionb reportequalsalarmcondition reportrangealarmcondition runsqlscripterroralarmcondition rocpointalarmcondition triggersqlprocedurealarmcondition
---	---

2.1 abdevicehealthalarmcondition

This table provides alarms for Allen Bradley Devices. You are required to select a condition type from the list below.

Available Conditions:

- 7 - Change to True
- 8 - Change to False.

9 - Change of State

2.2 alarminhibitalarmcondition

This is the parent table for the Alarm Inhibit State Alarm Condition table. You can view these alarms from this table, but cannot create them.

2.3 alarminhibitstatealarmcondition

This table provides alarms for NW3000 signals whose alarminhibit attribute has undergone a change. As well as specifying a signal, you are required to select a condition type from the list below.

Available Conditions: -

7 - Change to True

8 - Change to False

9 - Change of State

2.4 calculationstatusalarmcondition

This table provides alarms which are tied to the status of OE Calculations. You are required to select a condition type from the list below.

Available Conditions: -

7 - Change to True

8 - Change to False

9 - Change of State

2.5 digitalalarmcondition

This is the parent table for all digital alarm conditions. You can view digital alarm conditions from this table, but cannot create them. To create digital alarm conditions, you must select the specific digital alarm condition table.

2.6 digitalchangetonullalarmcondition

This table provides alarms for digital signals whose value changes to null. Since there is only one condition for this alarm, it is set automatically as:

19 - Change to Null

2.7 digitaldelayalarmcondition

This table provides alarms for digital signals that represent a delay mechanism. As well as specifying a signal, you are required to select a condition type from the list below.

Available Conditions: -

10 - Delayed On

11 - Delayed Off

2.8 digitalstatealarmcondition

This table provides alarms produced by digital signals when they undergo a Change of State, Change to True or Change to False condition. As well as specifying a signal, the you are required to select a condition type from the list below.

Available Conditions: -

7 -Change to True

8 - Change to False

9 -Change of State

2.9 integeranalogalarmcondition

This is the parent table for all integer analog alarm conditions. You can view integer analog alarm conditions from this table, but cannot create them. To create integer analog alarm conditions, you must select the specific integer analog alarm condition table.

2.10 integeranalogchangetonullalarmcondition

This table provides alarms for integer analog signals whose value changes to null. Since there is only one condition for this alarm, it is set automatically as:

19 - Change to Null

2.11 integeranalogchangeofvaluealarmcondition

This table provides alarms for integer analog signals which undergo any change of value. Since there is only one condition for this alarm, it is set automatically as:

9 - Change of State

2.12 integeranalogdeviationalarmcondition

This table provides alarms for integer analog signals whose value deviates beyond a user defined percentage. Since there is only one condition for this alarm, it is set automatically as:

12- Deviation

You must also set a deviation value, which represents the amount that the value may change before it is considered to meet the condition to generate an alarm.

2.13 integeranalogequalsalarmcondition

This table provides alarms for integer analog signals whose value equals a user defined value. There is only one condition for this alarm, which is set automatically as:

16 - Equals

2.14 integeranaloglimitalarmcondition

This table provides alarms for integer analog signals whose value can be mapped against six alarm conditions (low range, lowlow, low, high, highhigh and high range). As well as specifying a signal, you are required to select a condition type from the list below, and a limit value for the alarm. This value is used, along with the deadbands, to determine if the alarm condition has been violated..

Available Conditions: -

- 1 - High Range
- 2 - High High
- 3 - High
- 4 - Low
- 5 - Low Low
- 6 - Low Range

2.15 integeranalograteofchangealarmcondition

This table provides alarms for any integer analog signal based on a user defined allowable maximum change value within a one second period. Since there is only one condition for this alarm, it is set automatically as:

- 13 - Rate of Change

You must also set a change rate value, representing the allowed change of value per second that will not cause an alarm to be generated.

2.16 integeranalogsignalalarmcondition

This table allows limit alarms (low, lowlow, high, highhigh etc) to be placed on integer analog signals with the limit value being defined by another signal's value. As well as specifying a signal to be associated with the alarm, you are also required to select a second signal, which will determine the limit value. The value of this second signal is used, along with the deadbands, to determine if the alarm condition has been violated. You must also select a condition type from the list below.

Available Conditions: -

- 1 - High Range
- 2 - High High
- 3 - High
- 4 - Low
- 5 - Low Low
- 6 - Low Range

2.17 journalalarmcondition

This is the parent table for all journal alarm conditions. You can view journal alarm conditions from this table, but cannot create them. To create journal alarm conditions, you must select the specific derived journal alarm condition table.

2.18 journalequalalarmcondition

This table provides alarms which are defined by a particular journal task and an error number, which equals the event number of the journal task. Since there is only one condition for this alarm, it is set automatically as:

21 - Journal Message

2.19 journalrangealarmcondition

This table defines alarms which are linked to a particular journal task and a range of event numbers which, should they occur will generate an alarm. Since there is only one condition for this alarm, it is set automatically as:

21 - Journal Message

2.20 multistatedigitalalarmcondition

As the name suggests, this table provides alarms for multistate digital alarms. Since there is only one condition for this alarm, it is set automatically as:

20 - Multi State Digital

The state of the digital signal which raises the multidigital alarm is also defined by an integer, which is part of the alarm condition.

2.21 notesalarmcondition

The Notes Alarm Condition table stores alarm conditions that are added automatically by OpenEnterprise when an Alarm Type Note is created. Since this functionality is performed automatically based on the type of Note created, you should not attempt to create Note alarm conditions using the Alarm Condition Tool. However, Note alarm conditions created by OpenEnterprise for Alarm Notes may be viewed using the tool.

2.22 nw3000devicecommunicationalarmcondition

This table holds local Bristol device communication alarms. They can be set to create alarms for: -

- Write and Poll fails
- Write only fails
- Poll only fails

However, all options are assigned to only one Alarm Condition type. Since there is only one condition for this alarm, it is set automatically as:

25 - Communication Failure

Note: Alarms of this type are not **remote alarms**, and therefore should be configured as **local alarms** using the Alarm Configuration Tool.

2.23 nw3000devicestatusalarmcondition

The NW3000 Device Status Alarm Condition table holds the remote alarm conditions which indicate Status alarms for Bristol RTUs. They are added by the NW3000 DataBase Builder, and therefore cannot be created by the Alarm Condition Tool, although they can be viewed.

2.24 nw3000deviceversionalarmcondition

The NW3000 Device Status Alarm Condition table holds the remote alarm conditions which indicate Accol Version number mismatches for Bristol RTUs. They are added by the NW3000 DataBase Builder, and therefore cannot be created by the Alarm Condition Tool, although they can be viewed.

2.25 nw3000digitalalarmcondition

This table contains all of the remote NW3000 digital signal alarms, which are created automatically by the DataBase Build (DBB) process. They cannot be created and should NOT be edited directly using the configuration tool.

2.26 nw3000questionablealarmcondition

The NW3000 Questionable alarm condition allows the user to define which bit settings for the questionable attribute of a NW3000 signal will raise an alarm. The bit settings available are: -

- Bit 0 - (value when set = 1) - Signal value is marked as uncertain in the device
- Bit 1 - (value when set = 2) - Data Collection Failure (Template collection)
- Bit 2 - (value when set = 4) - Device is offline
- Bit 3 - (value when set = 8) - Analog value has been corrected (Not a Number etc.)

Since there is only one condition for this alarm, it is set automatically as:

24 - NW3000 Questionable

Note: Alarms of this type are not **remote alarms**, and therefore should be configured as **local alarms** using the Alarm Configuration Tool.

2.27 nw3000realanalogalarmcondition

This table holds the remote NW3000 realanalog alarms. They are created automatically by the DataBase Build (DBB) process, and should NOT be edited directly using the Alarm Condition tool.

2.28 oeprinteralarmcondition

The OEPrinterAlarmCondition table is used to monitor for changes in the status attribute of the OEPrinter object. When the alarmstate attribute is set to TRUE, the object is in alarm.

2.29 oeprintergroupalarmcondition

The OEPrinterGroupAlarmCondition table is used to monitor for changes in the status attribute of the OEPrinterGroup object. When the alarmstate attribute is set to TRUE, the object is in alarm.

2.30 questionablealarmcondition

This is the parent table for all questionable alarm conditions. You can view questionable alarm conditions from this table, but cannot create them. To create questionable alarm conditions, you must select the specific questionable alarm condition table.

2.31 questionableequalsalarmcondition

The Questionable Equals alarm condition allows the user to define a specific questionable attribute value for which an alarm should be raised, e.g. raise an alarm if the questionable attribute value is equal to 13. Since there is only one condition for this alarm, it is set automatically as:

23 - Questionable Equals

2.32 questionablerangealarmcondition

The Questionable Range alarm condition allows you to define a range of questionable attribute values for a signal that would constitute an alarm condition. You are required to define an upper and lower value, e.g. generate an alarm if the questionable attribute value lies between 2 and 7.

Since there is only one condition for this alarm, it is set automatically as:

22 - Questionable Range

2.33 realanalogalarmcondition

This is the parent table for all realanalog alarm conditions. You can view realanalog alarm conditions from this table, but cannot create them. To create realanalog alarm conditions, you must select the specific realanalog alarm condition table.

2.34 realanalogchangeofvaluealarmcondition

This table provides alarms for realanalog signals which undergo any change of value. The user must specify a signal to which this condition will be applied. Since there is only one condition for this alarm, it is set automatically as:

9 = Change of State

2.35 realanalogchangetonullalarmcondition

This table provides alarms for realanalog signals whose value changes to null. You must specify a signal. Since there is only one condition for this alarm, it is set automatically as:

19 = Change to Null

2.36 realanalogdeviationalarmcondition

This table provides alarms for realanalog signals whose value deviates beyond a user defined percentage. You must specify a signal. Since there is only one condition for this alarm, it is set automatically as:

12 - Deviation

Also, a deviation value must be configured, which represents the amount that the value may change before it is considered to meet the condition to generate an alarm.

2.37 realanalogequalsalarmcondition

This table provides alarms for realanalog signals whose value is checked for equality against a user defined value. You must also specify a signal.

There is only one condition for this alarm, which is set automatically as:

16 - Equals

2.38 realanaloglimitalarmcondition

This table provides alarms for realanalog signals whose value changes can be mapped against one of six alarm conditions. As well as specifying a signal, you are required to select a condition type from the list below, and a limit value for the alarm. This value is used, along with the deadbands, to determine if the alarm condition has been violated..

Available Conditions: -

1 High Range

2 High High

3 High

4 Low

5 Low Low

6 Low Range

2.39 realanalograteofchangealarmcondition

This table provides alarms for any realanalog signal based on a user defined allowable maximum change value within a one second period. You must specify a signal. Since there is only one condition for this alarm, it is set automatically as:

13 - Rate of Change

Also, a value representing the allowed change of value per second that will not cause an alarm to be generated.

2.40 realanalogsignalalarmcondition

This table allows limit alarms (low, lowlow, high, highhigh etc) to be placed on realanalog signals with the limit value being defined by another signal's value. As well as specifying a signal to be associated with the alarm, you are also required to select a second signal, which will determine the limit value.

The value of this second signal is used, along with the deadbands, to determine if the alarm condition has been violated. You must also select a condition type from the list below.

Available Conditions: -

1 High Range

2 High High

3 High

4 Low

5 Low Low

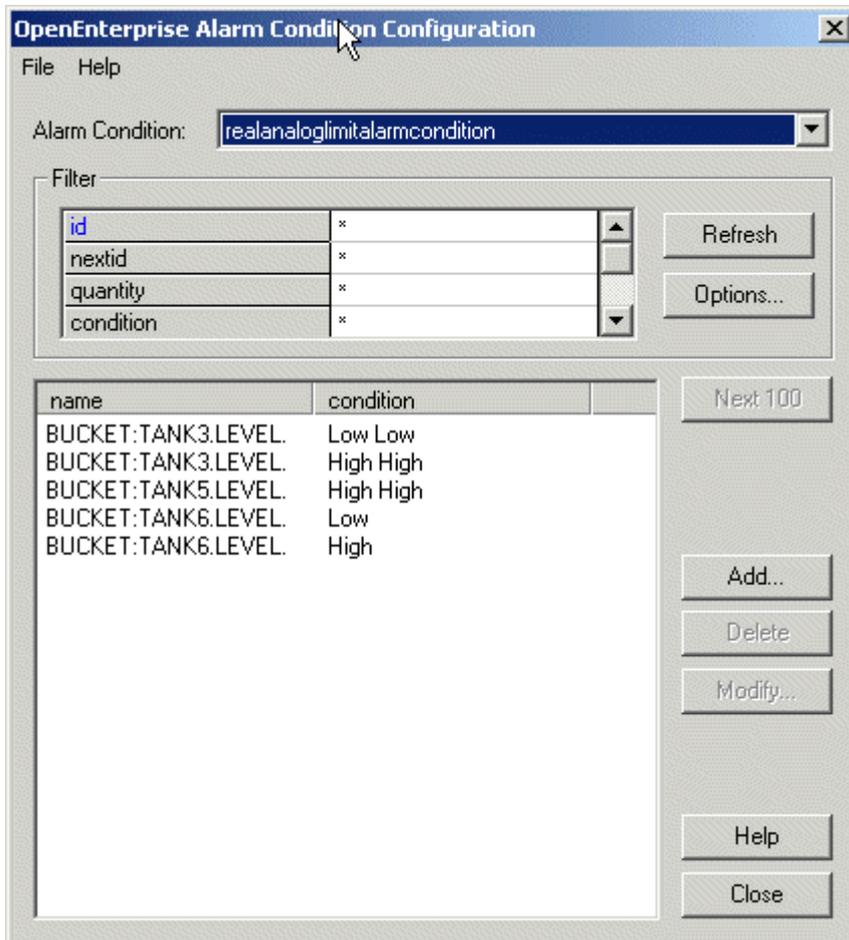
6 Low Range

2.41 redundancyalarmcondition

The Redundancy Alarm Condition tables hold change of state alarm conditions for Redundant OpenEnterprise Servers, and are entered automatically. They cannot be created by the Alarm Condition Tool.

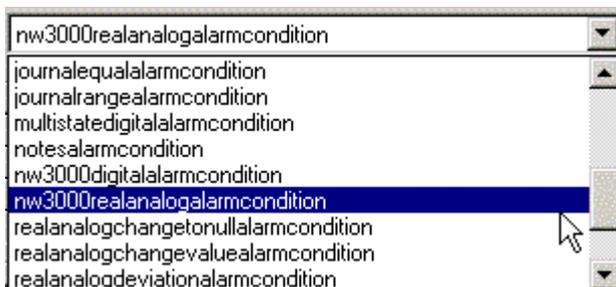
3 Alarm Condition Configuration

The Alarm Conditions tool main dialog enables you to select an Alarm Condition table and add, modify or delete alarm conditions.



3.1 Alarm Condition Table Drop Down List

This drop-down list reveals the alarm condition tables. The selected table is queried immediately, and alarm conditions are displayed in the alarm condition list. The **[Options]** button enables you to delay the display of alarm conditions until the **[Refresh]** button is selected.



3.2 Filter Grid Entry

The Filter Grid section enables the user to filter the Conditions List by any attribute in the selected Alarm Condition table. When the **[Refresh]** button is selected, the Alarm Condition List will be refreshed according to the filters applied here. For a detailed description of how to use wildcards and filter for special characters within the filter grid, see the [Filtering with Wildcards](#) topic.

3.3 Filtering with Wildcards

The filter grid allows use of wildcard characters, character lists, or character ranges, in any combination, to match strings.

The following table shows the characters allowed in patterns and what they match:

Character(s) in pattern	Matches in string
?	Any single character.
*	Zero or more characters.
#	Any single digit (0 - 9).
[charlist]	Any single character in charlist.
[!charlist]	Any single character not in charlist.

A group of one or more characters (charlist) enclosed in brackets ([]) can be used to match any single character in string and can include almost any character code, including digits.

Note: The special characters left bracket ([), question mark (?), number sign (#), and asterisk (*) can be used to match themselves directly only by enclosing them in brackets. The right bracket (]) can't be used within a group to match itself, but it can be used outside a group as an individual character.

In addition to a simple list of characters enclosed in brackets, charlist can specify a range of characters by using a hyphen (-) to separate the upper and lower bounds of the range. For example, [A-Z] in a pattern results in a match if the corresponding character position in string contains any of the uppercase letters in the range A through Z. Multiple ranges are included within the brackets without any delimiters.

The meaning of a specified range depends on the character ordering valid at run time (as determined by the locale setting of the system the code is running on). The range [A - E] matches A, a, À, à, B, b, E, e. Note that it does not match Ê or ê because accented characters fall after unaccented characters in the sort order.

Other important rules for pattern matching include the following:

- An exclamation point (!) at the beginning of charlist means that a match is made if any character except the ones in charlist is found in the string. When used outside brackets, the exclamation point matches itself.
- The hyphen (-) can appear either at the beginning (after an exclamation point if one is used) or at the end of charlist to match itself. In any other location, the hyphen is used to identify a range of characters.
- When a range of characters is specified, they must appear in ascending sort order (from lowest to highest). [A-Z] is a valid pattern, but [Z-A] is not.

- The character sequence [] is ignored: it is considered a zero-length string.

3.4 Refresh Button

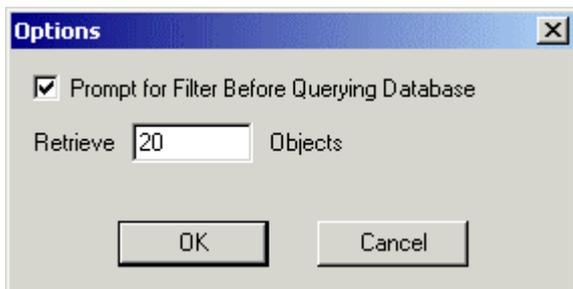
When the [Refresh] button is selected the Conditions List is updated according to the latest filter and the first 100 High Alarm Condition Objects in the selected table are shown unless this number has been changed by using the [Options] button.

3.5 Options Button

When the [Options] button is selected the Options dialog is displayed which allows the user to change the default number of records which will be displayed in the Conditions List.

3.6 Options

The Alarm Conditions Options dialog allows the User to change the default number of objects (alarm conditions) which will be displayed in the Conditions List. In the example below the number has been changed from 100 to 20.



3.6.1 Number of Objects to Retrieve Field

The number typed into this field determines the maximum number of objects that will be returned and displayed in the Alarm Condition List each time a new Alarm Condition table is selected or a new filter is added to the Filter Grid and the [Refresh] button is selected.

3.6.2 Prompt for Filter Check Box

If the 'Prompt for Filter Before Querying Database' box is checked, then when a new alarm condition table is selected a message at the top of the Alarm Condition List will prompt the user to press the [Refresh] button before the list is filled.

3.7 Next 100 Button

If the query returns more than 100 objects, selecting this button will query the database for the next 100 objects. The number of objects returned per query is set by default to 100, but this number can be altered on the Options Dialog. This is accessed by selecting the [Options] button on the Main Dialog.

3.8 Alarm Condition List

The Alarm Condition List allows the user to view Alarm Condition Objects found in the selected table using any filters applied in the filter grid.

By default only the first 100 objects will be shown. The window may be scrolled up and down using the scroll bar on the right hand side of the window. The user may view further objects by clicking on the **[Next 100]** command button. This will clear the Alarm Conditions List and display the next 100 entries which match the criteria in the Filter Grid section.

3.9 Add Button

When the **[Add]** button is selected, the Add Alarm Condition dialog is displayed allowing the user to add an alarm condition. The Add Alarm Condition dialog is exactly the same as the Modify Alarm Condition dialog apart from the title across the top.

3.10 Delete Alarm Condition Button

Selecting the **[Delete]** button enables the user to delete the selected alarm condition. The user will first be prompted regarding the deletion of the alarm condition.

3.11 Modifying Alarm Conditions

When the **[Modify]** button is selected the Modify Alarm Condition dialog is displayed, allowing the user to modify the alarm condition. The Modify Alarm Condition dialog is exactly the same as the Add Alarm Condition Dialog apart from the title across the top.

3.12 Help Button

Selection of this button will display the Main Dialog help topic.

3.13 Close Button

Closes the Alarm Condition Configuration Tool.

4 Add/Modify Alarm Condition

The example below shows the Add/Modify Alarm Condition Dialog as it would appear if the `realanaloglimitalarmcondition` table had been selected. If another alarm condition table had been chosen, the dialog could look slightly different, for example, see the Questionable Mask page. Typically, all fields and buttons from *Priority* down to *Signal* will be the same, whatever Alarm Condition table has been selected.

For an outline of special user input required for other types of alarm conditions, select the alarm condition table from the Alarm Condition Tables topic.

The screenshot shows a dialog box titled "Add Alarm Condition to realanaloglimitalarmcondition". The fields and controls are as follows:

- Priority:** A dropdown menu currently showing "Alarm Priority #0".
- Precedence:** A text input field containing the value "0".
- Suppress:** An unchecked checkbox.
- Suppression Groups:** A button labeled "Configure".
- Alarm Redirection:** A button labeled "Configure".
- Sound:** A button labeled "Configure".
- Help Text:** An empty text input field.
- Condition:** A dropdown menu currently showing "High".
- Signal:** A text input field with a "Browse..." button to its right.
- Limit:** An empty text input field.
- Dead Band In:** An empty text input field.
- Dead Band Out:** An empty text input field.
- Buttons:** "OK", "Cancel", and "Help" buttons are located at the bottom of the dialog.

4.1 Priority

Selection of this mandatory field will display a drop-down list of alarm priorities. The user should select the correct description for the priority which is being added. The field value defaults to *Alarm Priority #0*.

4.2 Precedence

This mandatory field represents an overall level of importance for an alarm condition that is applied to a particular signal. It is particularly helpful when there are a number of alarm conditions attached to a signal. For instance there may be a Low and LowLow condition on a Tank Level. If the signal changes from Normal to LowLow, a Low alarm will also be generated during the signal transition.

The precedence attribute will distinguish between these conditions so that the condition with the highest Precedence will be displayed as the Current State of the Signal. You must type a valid integer into this field if it is to be effective, otherwise the value will default to 0 (the lowest precedence). A high number equals high Precedence, a low number equals a low Precedence. Numbers may range between 0 and 999,999,999.

4.3 Suppress

Checking this optional tick box will cause this specific alarm condition to be automatically suppressed when the alarm is generated. Note that suppression only affects the display of the alarm in the Alarm View client. A suppressed alarm will still exist in the Alarm Summary table.

4.4 Suppression Groups

Clicking on this optional button will display the Suppression Group Association Dialog.

4.5 Alarm Redirection Button

This button is disabled when an alarm condition is being created, because Alarm Redirection can only operate on alarm conditions that already exist.

If you want to apply Alarm Redirection, first create the Alarm Condition, then refresh the Alarm Condition List on the Main Dialog, and select the new Alarm Condition. Finally, select the **[Modify]** button. The Alarm Redirection button will then be enabled on the Modify Alarm Condition dialog, and when selected will display the Alarm Redirection Dialog.

It is possible to configure a .WAV sound file to be played when an alarm appears in the Alarm Summary table on a per alarm condition basis. Selecting this **[Configure]** button opens the Sound Configuration dialog which allows a sound file to be associated with this alarm condition.

4.6 Help Text

This is a simple text entry field into which the user may enter text which could help in understanding the nature of the alarm. The Help Text field can be made to appear in the Alarm Client as an attribute. Up to 46 characters may be entered into the Help Text field.

4.7 Condition Field

This is a mandatory drop-down list which displays all of the available alarm condition types for this alarm condition table. The available alarm condition types for the RealAnalogLimit table are Low Range, LowLow, Low, High, High High and High Range. For the available alarm condition types for other alarm conditions, see the Alarm Condition Lookup Table or the Alarm Condition Tables topics.

4.8 Signal

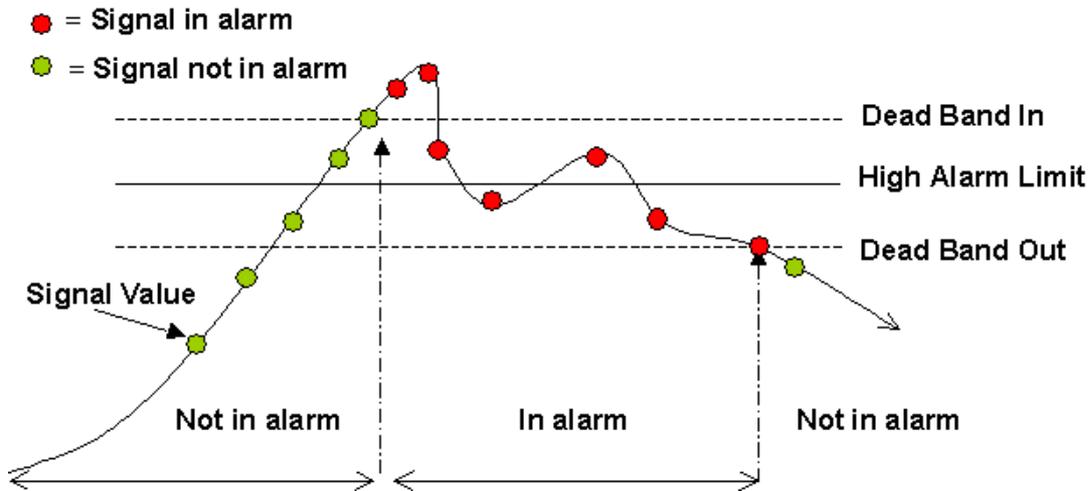
Type the signal name directly into this mandatory field if it is known, or use the [Browse] button to the right of the field to browse for the signal.

4.9 Limit Field

This is the mandatory value attached to the limit. When the signal reaches this value it will be placed in alarm.

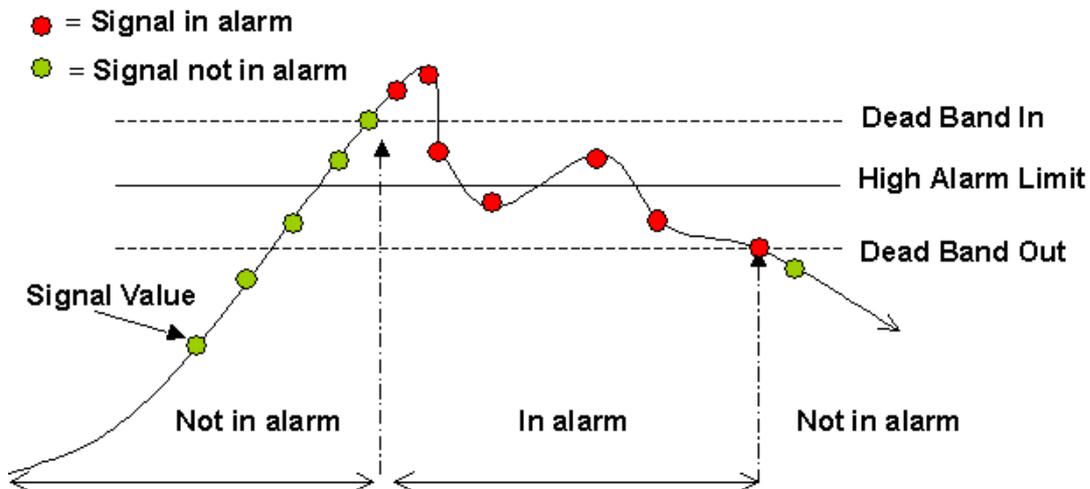
4.10 Dead Band In Field

This optional field represents a value higher or lower than the alarm limit value (depending on whether the limit is higher or lower than the normal value range for the signal), which will delay the signal going into alarm as the signal's value passes the alarm limit value. See the diagram below.



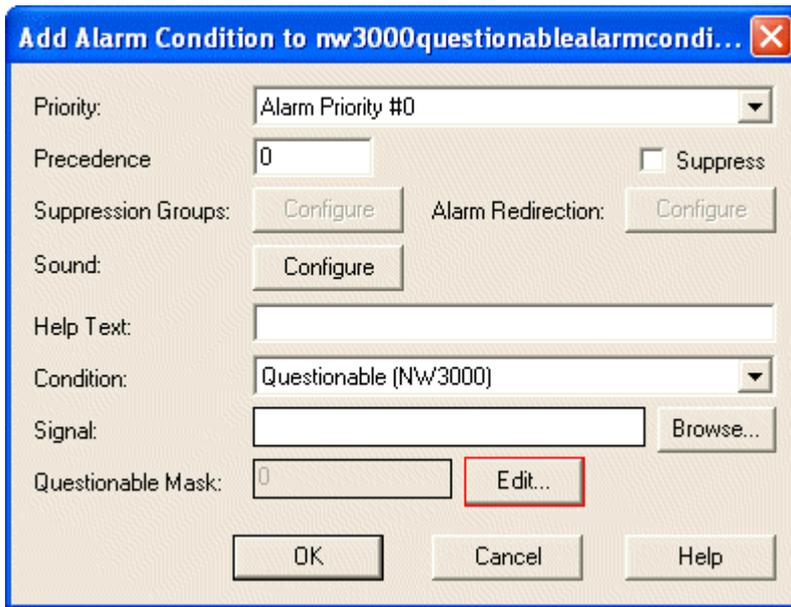
4.11 Dead Band Out Field

This optional field represents a value higher or lower than the alarm limit value (depending on whether the limit value is higher or lower than the normal value range for the signal), which will cause the signal to remain in alarm as the signal's value varies by small amounts about the alarm limit value. See the diagram below.



4.12 Questionable Mask

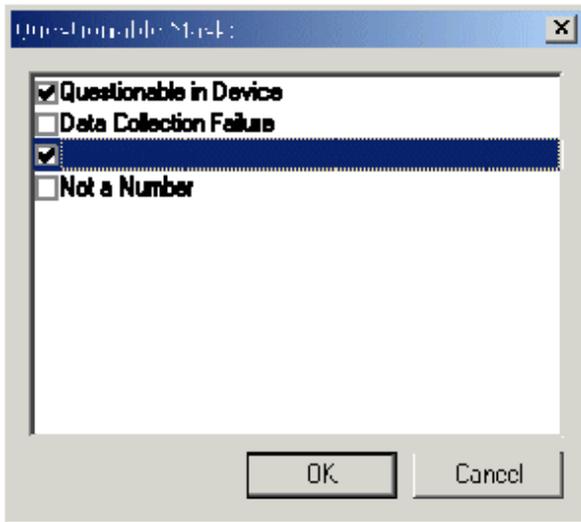
When configuring NW3000 Questionable alarm conditions, the NW3000 Questionable Mask Dialog allows the user to define which bit settings for the questionable attribute of a NW3000 signal will raise an alarm. The **Questionable Mask** dialog is opened from the **Add Alarm Condition** dialog, when the **Edit...** button, to the right of the **Questionable Mask** field is selected. This button is highlighted in red below.



4.12.1 Bit Settings

The bit settings available are: -

- Bit 0 - (value when set = 1) - Questionable in the device
- Bit 1 - (value when set = 2) - Data Collection Failure
- Bit 2 - (value when set = 4) - Device Offline
- Bit 3 - (value when set = 8) - Not a Number



4.12.2 Questionable in Device

When this box is checked, if the questionable value of the signal indicates that the value of the signal is questionable in the device, a NW3000 questionable alarm will be raised against the signal.

4.12.3 Data Collection Failure

When this box is checked, if the questionable value of the signal indicates that there has been a Data Collection Failure for signals collected by Template, a NW3000 questionable alarm will be raised against the signal.

4.12.4 Device Offline

When this box is checked, if the questionable value of the signal indicates that the Device is Offline, a NW3000 questionable alarm will be raised against the signal.

4.12.5 Not a Number

When this box is checked, if the questionable value of the signal indicates that the Analog value has been corrected (Not a Number etc.), a NW3000 questionable alarm will be raised against the signal.

4.12.6 OK Button

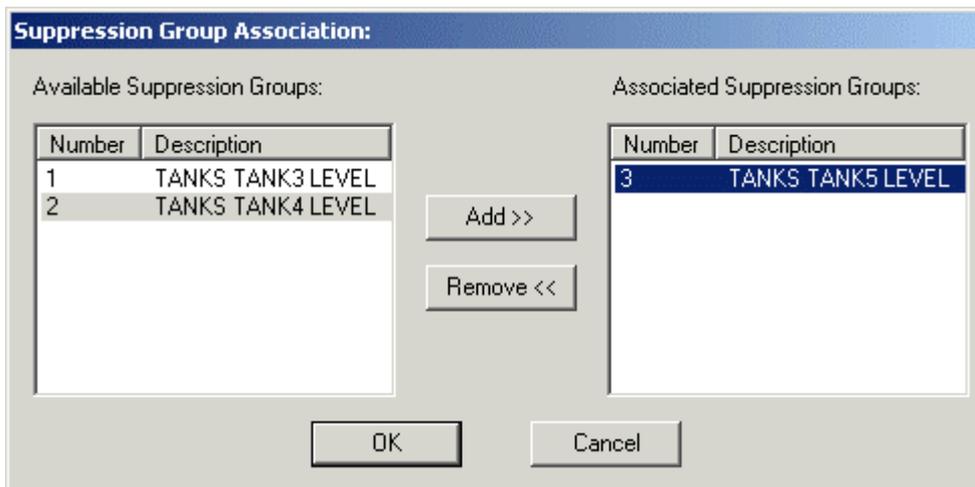
Selection closes the Questionable Mask Dialog, and enters the selected options into the *Questionable Mask* field on the parent dialog. The selected options are converted to the corresponding bit number represented by the selections.

4.12.7 Cancel Button

Selection closes the Questionable Mask Dialog, but does not enter the selected options into the *Questionable Mask* field on the parent dialog.

4.13 Suppression Group Association

The Suppression Group Association dialog enables you to associate the selected alarm condition with a Suppression Group. for more information on Suppression Groups see the Suppression Groups Help file.



4.13.1 Available Suppression Groups

This is a list of the Suppression Groups currently available for association with the selected alarm condition.

4.13.2 Add Suppression Group Button

This button will add a selected Suppression Group from the 'Available Suppression Groups' list to the 'Associated Suppression Groups' list. The selected alarm condition will then be associated with that Suppression Group.

4.13.3 Remove Suppression Group Button

This button will remove a selected Suppression Group from the 'Associated Suppression Groups' list and it will appear again in the 'Available Suppression Groups' list. The selected alarm condition will not then be associated with that Suppression Group.

4.13.4 Associated Suppression Groups

This is a list of the Suppression Groups currently associated with the selected alarm condition.

4.13.5 OK Button

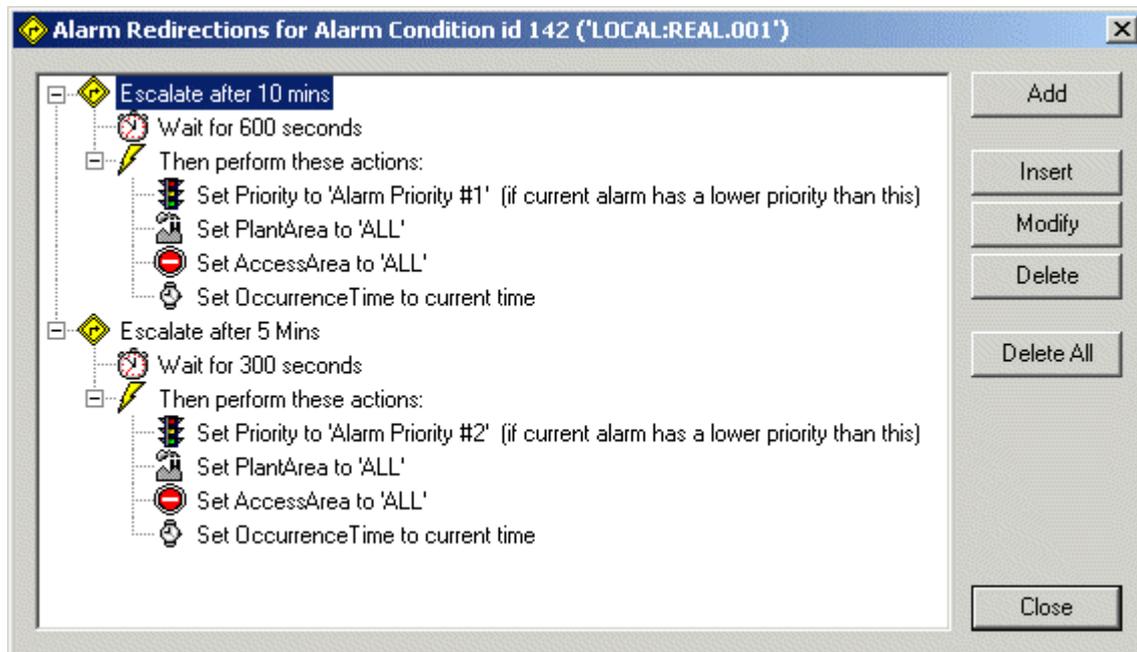
Selection will close the dialog and update the Database with any changes made.

4.13.6 Cancel Button

Selection will close the dialog without updating the Database with changes made.

4.14 Alarm Redirection

Alarm Redirection enables the user to escalate an alarm condition's priority or change other attributes of an alarm after a specified period of time, in order to ensure it is dealt with.



4.14.1 Title Bar

The Title bar contains the unique id number of the alarm condition to which the Alarm Redirection will be applied, as well as the signal or object that the alarm condition is associated with.

4.14.2 Alarm Redirections

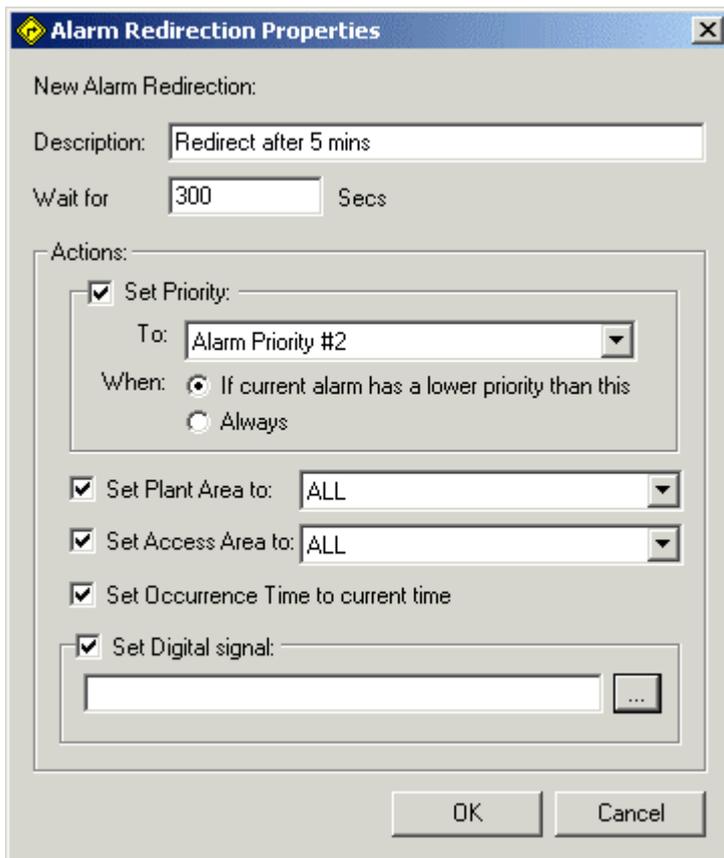
This window displays the configured Alarm Redirections. Each single Alarm Redirection in the list opens up to reveal the specific escalation and redirection properties that have been set for it.

4.14.3 Add button

When the **[Add]** button is selected, the Alarm Redirection Properties Dialog is displayed ready for the user to configure a new Alarm Redirection item for the selected alarm condition. The new Alarm Redirection object will appear at the bottom of the current list of Alarm Redirection objects.

4.14.4 Alarm Redirection Properties

The Alarm Redirection Properties Dialog is displayed whenever the Add, Insert or Modify buttons of the Alarm Redirection Dialog are selected. It enables the user to create or modify a particular Alarm Redirection.



4.14.4.1 Alarm Redirection Description

Type in an informative description here of what the Alarm Redirection does.

4.14.4.2 Wait for

The time to wait before implementing the Alarm Redirection.

4.14.4.3 Set Priority Check

When this box is checked, the priority drop-down list becomes enabled. The user is able to select a new priority for the alarm to be implemented when the 'Wait for' time has expired.

4.14.4.4 Set Priority to

This is a list of priorities that have been configured in the AlarmPriorityBlock table. Click on the drop-down list and select a new priority for the alarm condition.

4.14.4.5 Set Priority if current lower

If checked, the new priority will only be applied if it is higher than the current priority.

4.14.4.6 Always

If checked, the new priority will be applied to the alarm even if it is lower than the alarm's current priority.

4.14.4.7 Set Plant Area Check

When checked, the Plant Area drop-down list becomes enabled, allowing a new Plant Area to be assigned to the alarm after the 'Wait' time has expired.

4.14.4.8 Plant Areas

When this is enabled, the user can click on it and select a new Plant Area, which will be assigned to the alarm after the 'Wait' period expires.

4.14.4.9 Set Access Area Check

When checked, the Access Area drop-down list becomes enabled, allowing a new Access Area to be assigned to the alarm after the 'Wait' time has expired.

4.14.4.10 Access Areas

When this is enabled, the user can click on it and select a new Access Area, which will be assigned to the alarm after the 'Wait' period expires.

4.14.4.11 Set Occurrence Time Check

When checked, the Occurrence Time of the alarm will be reset to the current time when the 'Wait' period expires.

4.14.4.12 Set Digital Signal Check

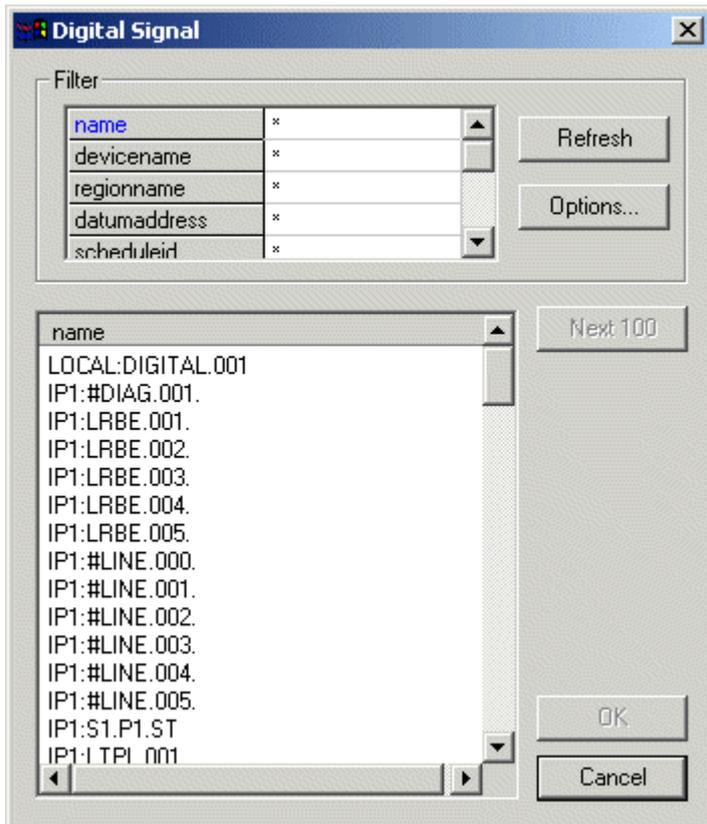
Selection of this button enables the Digital Signal name field and browse button. This allows the user to select a Digital Signal which will be set to True when the 'Wait' time expires.

4.14.4.13 Set Digital Name

Once a signal has been selected using the 'Browse for Signal' dialog (accessed from the browse button to the right of this field), it is placed in here. The signal name can also be typed directly into this field, if it is known.

4.14.4.14 Browse for Digital Signal

The dialog enables the user to browse for a Digital signal.



4.14.4.14.1 Browse for Signal Filter Grid

The signal list may be filtered by entering filter criteria into any of the attributes in the 'Filter' section as shown in the example. The use of wildcards represented by the asterisk (*) is demonstrated. An asterisk will ignore any number of characters in the name of the signal until the next specified character is found. A question mark (?) may be used to indicate a wildcard which just ignores one character.

For a detailed description of how to use wildcards and filter for special characters within the filter grid, see the [Filtering with Wildcards](#) topic.

4.14.4.14.2 Browse for Signal Refresh Button

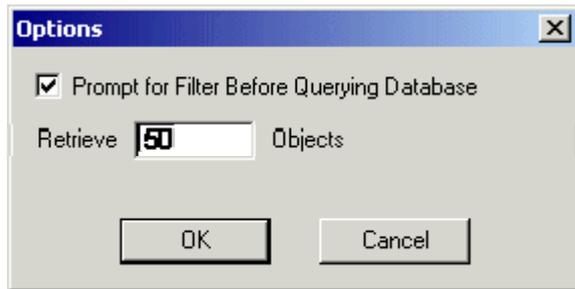
When the **[Refresh]** button is selected the Signal List is updated according to the latest filter and the first 100 Signals which match the filter in the filter grid are shown unless this number has been changed by using the **[Options]** button.

4.14.4.14.3 Browse for Signal Options Button

When the [Options] button is selected the *Options* dialog is displayed which allows the user to change the default number of records which will be displayed in the Signal List.

4.14.4.14.4 Options Dialog

The Browse for Signal Options dialog allows the User to change the default number of objects (signals) which will be displayed in the Signals List. In the example below the number has been changed from 100 to 50.



4.14.4.14.4.1 Browse for Signal Filter Prompt

If the 'Prompt for Filter Before Querying Database' box is checked, then when a new filter is applied to the Browse for Signal dialog a message at the top of the Signal List will prompt the user to press the [Refresh] button before the new query is sent.

4.14.4.14.4.2 Browse for Signal Number of Objects

The number typed into this field determines the maximum number of objects that will be returned and displayed in the Signal List each time a new filter is added to the Filter Grid and the [Refresh] button is selected.

4.14.4.14.5 Browse for Signal Next Button

When this button is selected the next batch of signals matching the filter in the Filter Grid will be returned and displayed in the Signal List. The number defaults to 100, but may be changed using the [Options] button.

4.14.4.14.6 Signal List

This pane displays the signals returned by the query based on the filter supplied in the Filter Grid. The number of signals displayed per query is determined by the number of objects to retrieve value, which is set on the Options dialog.

4.14.4.14.7 Browse for Signal OK Button

When a signal has been selected from the Signal List, selecting the [OK] button will enter the signal name into the signal field on the main Alarm Condition dialog and the *Browse for Signal* dialog will close.

4.14.4.15 Alarm Redirection Properties OK button

When selected, any configuration changes will be saved to the database and the dialog will close.

4.14.4.16 Alarm Redirection Properties Cancel button

When selected, the dialog will close. Any configuration changes will not be saved to the database and will be lost.

4.14.5 Alarm Redirection Insert button

When the **[Insert]** button is selected, the Alarm Redirection Properties Dialog is displayed ready for the user to insert a new Alarm Redirection item for the selected alarm condition. The new Alarm Redirection will be added immediately above the currently selected Alarm Redirection.

4.14.6 Alarm Redirection Modify button

When the **[Modify]** button is selected, the Alarm Redirection Properties Dialog is displayed with the details of the selected Alarm Redirection object. The user can then make changes to any of the fields and save the changes to the database.

4.14.7 Alarm Redirection Delete Button

Selection of this button will delete the currently selected Alarm Redirection item. The user will be required to confirm the action prior to the applicable database configuration being deleted.

4.14.8 Alarm Redirection Delete All button

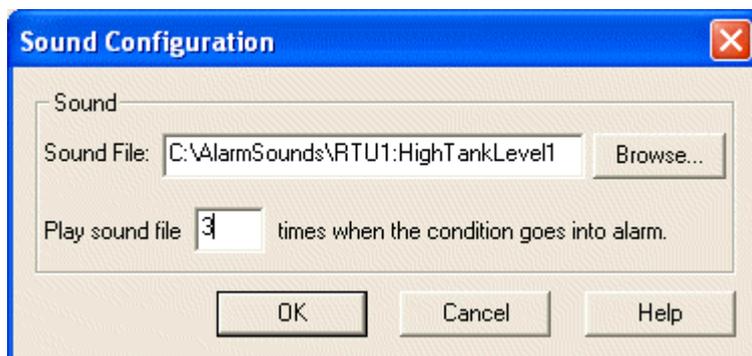
Selection of this button will delete all Alarm Redirection items currently configured and displayed for this alarm condition. The user will be required to confirm the action prior to the applicable database configuration being deleted.

4.14.9 Alarm Redirection Close button

The Alarm Redirection dialog will close.

4.15 Sound Configuration

The Sound Configuration Dialog enables the user to configure a .WAV sound file to be played when this particular alarm condition appears in the Alarm View client. By default sound files are played according to priority alone. This behaviour is configured from the Alarm Priority Configuration Tool. For an example of how priority and alarm condition based sounds are handled within the Alarm View client, see the *Sound Configuration Example* page.



4.15.1 Sound File

You may either manually enter the name and location of a .WAV file, or use the Browse&ldots; button to invoke the standard File Open dialog and select the file you wish to use.

4.15.2 Play Sound Number of Times

Defines the number of times that the .WAV file should be played. A value of &endash;1 will indicate that the file should be played infinitely, and 0 that the file should not be played. Values between &endash;1 and 9999 will be allowed.

4.15.3 Sound Configuration Example

To assist with an understanding of how sound files are played, the following example is provided. The names used refer to files with a .WAV extension.

The Default Alarm Priority Sound Configuration for priority 0 alarms is to play, ”Low Priority Alarm Requires Attention”, For priority 1 alarms the default is to play, ”High Priority Alarm Requires Attention”.

Priority 1 alarms have higher precedence than priority 0 alarms.

A Priority 0 alarm is reported to a previously empty Alarm Client instance, which has it’s own sound configuration defined to play ”Low Tank level on Tank 3” five times. A second Priority 0 alarm is reported after the first Priority 0 alarm has been played once. It is configured to play ”Abnormal Flow in Pipe X35” five times.

”Low Tank Level on Tank 3” has played four times, when a Priority 1 alarm is reported with it’s own sound configuration defined to play ”Boiler 2’s Pressure Has Exceeded Safe Limits” three times. After this has been played twice a second priority 1 alarm is reported. It is defined to play ”Explosion Imminent Clear Building” continually until it is acknowledged.

This alarm is eventually acknowledged, but not until the first priority 1 alarm has played its .WAV file the requisite number of times. The original Priority 1 alarm is acknowledged also, followed finally by the two Priority 0 alarms.

This is what the operator would have heard&ldots;

[Priority 0 Alarm Reported]

”Low Tank Level on Tank 3”

”Low Tank Level on Tank 3”

[Second Priority 0 Alarm Reported]

”Abnormal Flow in Pipe X35”

”Low Tank Level on Tank 3”

”Abnormal Flow in Pipe X35”

”Low Tank Level on Tank 3”

[Priority 1 Alarm Reported]

”Boiler 2's Pressure Has Exceeded Safe Limits"

”Boiler 2's Pressure Has Exceeded Safe Limits"

[Second Priority 1 Alarm Reported]

”Explosion Imminent Clear Building"

”Boiler 2's Pressure Has Exceeded Safe Limits"

[The First Priority 1 alarm has now played its .WAV file the requisite number of times]

”Explosion Imminent Clear Building"

”Explosion Imminent Clear Building"

”Explosion Imminent Clear Building"

”Explosion Imminent Clear Building"

[Second Priority 1 Alarm Acknowledged]

”High Priority Alarm Requires Attention"

”High Priority Alarm Requires Attention"

[First Priority 1 Alarm Acknowledged]

”Abnormal Flow in Pipe X35"

”Low Tank Level on Tank 3"

”Abnormal Flow in Pipe X35"

”Low Tank Level on Tank 3"

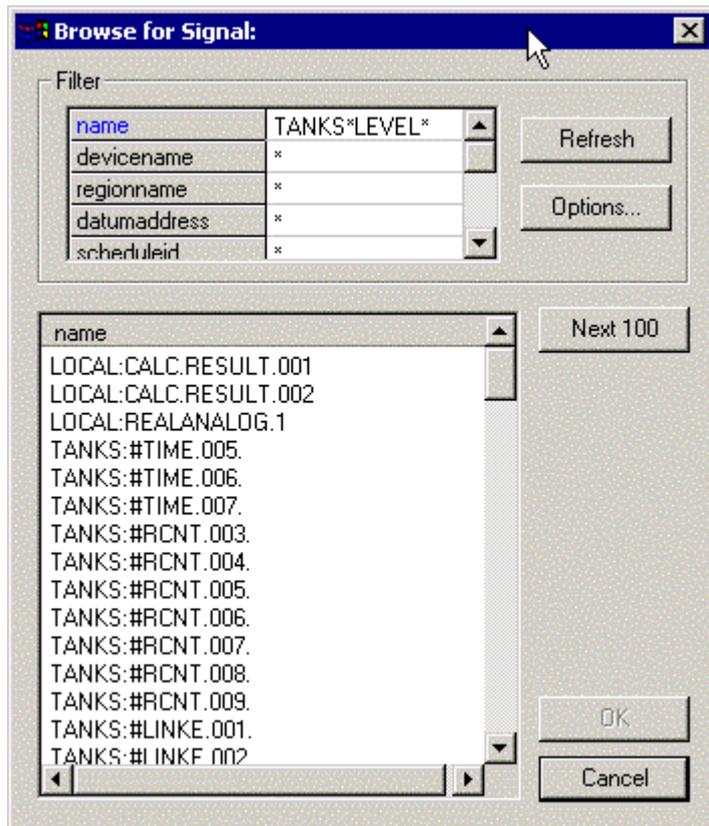
[Both Priority 0 Alarms Are Acknowledged]

Note that because the .WAV files associated with the Priority 0 alarms were not played the requisite number of times (i.e. 5) before the first Priority 1 alarm came in, they are therefore replayed once the Priority 1 alarms have been acknowledged. If they had been played the requisite number of times, then once the Priority 1 alarms had been acknowledged, the Default Alarm Priority Sound Configuration for Priority 0 alarms, i.e. ”Low Priority Alarm Requires Attention", would have been played instead.

Sound Configuration Dialog

4.16 Browse For Signal

The *Browse for Signal* Dialog enables the user to find the signal which will be associated with the alarm condition.



4.16.1 Browse for Signal Filter Grid

The signal list may be filtered by entering filter criteria into any of the attributes in the 'Filter' section as shown in the example. The use of wildcards represented by the asterisk (*) is demonstrated. An asterisk will ignore any number of characters in the name of the signal until the next specified character is found. A question mark (?) may be used to indicate a wildcard which just ignores one character.

For a detailed description of how to use wildcards and filter for special characters within the filter grid, see the [Filtering with Wildcards](#) topic.

4.16.2 Browse for Signal Refresh Button

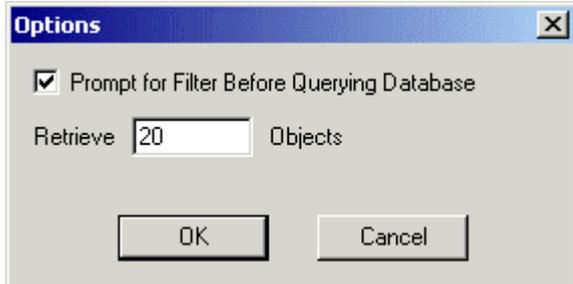
When the **[Refresh]** button is selected the Signal List is updated according to the latest filter and the first 100 Signals which match the filter in the filter grid are shown unless this number has been changed by using the **[Options]** button.

4.16.3 Browse for Signal Options Button

When the **[Options]** button is selected the *Options* dialog is displayed which allows the user to change the default number of records which will be displayed in the Signal List.

4.16.4 Options

The Alarm Conditions Options dialog allows the User to change the default number of objects (alarm conditions) which will be displayed in the Conditions List. In the example below the number has been changed from 100 to 20.



4.16.4.1 Browse for Signal Filter Prompt

If the 'Prompt for Filter Before Querying Database' box is checked, then when a new filter is applied to the Browse for Signal dialog a message at the top of the Signal List will prompt the user to press the **[Refresh]** button before the new query is sent.

4.16.4.2 Browse for Signal Number of Objects

The number typed into this field determines the maximum number of objects that will be returned and displayed in the Signal List each time a new filter is added to the Filter Grid and the **[Refresh]** button is selected.

4.16.5 Signal List

This pane displays the signals returned by the query based on the filter supplied in the Filter Grid. The number of signals displayed per query is determined by the number of objects to retrieve value, which is set on the Options dialog.

4.16.6 Browse for Signal Next Button

When this button is selected the next batch of signals matching the filter in the Filter Grid will be returned and displayed in the Signal List. The number defaults to 100, but may be changed using the **[Options]** button.

4.16.7 Browse for Signal OK Button

When a signal has been selected from the Signal List, selecting the **[OK]** button will enter the signal name into the signal field on the main Alarm Condition dialog and the *Browse for Signal* dialog will close.

5 Glossary

L

Local Alarms: Alarms that are configured using the Alarm Condition Tool. These alarms are generated by OpenEnterprise.

R

Remote Alarms: Alarms that are configured and generated within the RTU. OpenEnterprise supports remote alarms for Bristol Babcock RTUs. The NW3000 Database Builder enters remote alarm conditions configured within Bristol Babcock RTUs into the database during the database build process. These alarms are initially generated at the RTU, and reported to OpenEnterprise. OpenEnterprise then generates the alarms.

6 Index

A

Abdevicehealthalarmcondition 6

Access Area 31, 32

Access Area Check..... 31

Add 28

Add Alarm Condition Button..... 20

Add Alarm Condition Dialog..... 23

Alarm Condition Elements..... 1

Alarm Condition List..... 20

Alarm Condition Lookup Table..... 2

Alarm Condition Table Drop Down List..... 17

Alarm Condition Tables..... 5, 17

Alarm Conditions..... 38

Alarm Conditions Browse..... 38

Alarm Conditions Main Dialog..... 17

Alarm Conditions Options Dialog..... 19, 39

Alarm Conditions Overview..... 1

Alarm Redirection..... 30, 35

Alarm Redirection Add button 30

Alarm Redirection Close button 35

*Alarm Redirection Configure button disabled*24

Alarm Redirection Delete All button 35

Alarm Redirection Description..... 31

Alarm Redirection Dialog 29

Alarm Redirection Dialog Title Bar..... 29

Alarm Redirection Insert button 35

Alarm Redirection Modify button..... 35

Alarm Redirection Properties Dialog..... 30

AlarmConditionList..... 20

Alarminhibitalarmcondition 6

Alarminhibitstatecondition 6

Always..... 31

AR Cancel button..... 35

AR OK button..... 35

Associated Suppression Groups..... 29

Available Suppression Groups..... 28

B

Browse 32, 33, 34, 38, 39, 40

Signal Filter Grid 33, 38

Signal Filter Prompt 34, 39

Signal Next Button 34, 40

Signal Number 34, 39

Signal OK Button 34, 40

Signal Options Button 33, 39

Signal Options Dialog 34

Signal Refresh Button 33, 39

C

Calculationstatusalarmcondition..... 6

Cancel Button 29

Close Button 21

Condition Field..... 25

Current lower 31

D

Data Collection Failure 27

Dead Band In Field..... 25

Dead Band Out Field..... 25

Delete Button..... 21, 35

Device..... 27

Device Offline 27

Digital..... 32

Digitalalarmcondition 7

Digitalchangetonullalarmcondition..... 7

Digitaldelayalarmconditions..... 7

Digitalstatealarmcondition 7

F

Filter Check Box 20

Filter Grid Entry..... 18

H

Help Button 21

Help Text 24

I

Integeranalogalarmcondition 7

Integeranalogchangeofvaluealarmcondition
n 8

Integeranalogchangetonullalarmcondition... 8

Integeranalogdeviationalarmcondition..... 8

Integeranalogequalsalarmcondition..... 8

Integeranaloglimitalarmcondition..... 8

Integeranalograteofchangealarmcondition.. 9

<i>Integeranalogsignalalarmcondition</i>	9	<i>Questionablealarmcondition</i>	12
J		<i>Questionableequalsalarmcondition</i>	12
<i>Journalalarmcondition</i>	9	<i>Questionablerangealarmcondition</i>	12
<i>Journalequalalarmcondition</i>	10	R	
<i>Journalrangealarmcondition</i>	10	<i>Realanalogalarmcondition</i>	12
L		<i>Realanalogchangeofvaluealarmcondition</i> .	13
<i>Limit Field</i>	25	<i>Realanalogchangetonullalarmcondition</i>	13
M		<i>Realanalogdeviationalarmcondition</i>	13
<i>Modify Alarm Condition Button</i>	21	<i>Realanalogequealsalarmcondition</i>	13
<i>Multistatedigitalalarmcondition</i>	10	<i>Realanaloglimitalarmcondition</i>	13
N		<i>Realanalograteofchangealarmcondition</i>	14
<i>Next 100 Button</i>	20	<i>Realanalogsignalalarmcondition</i>	14
<i>Notesalarmcondition</i>	10	<i>Redundancyalarmcondition</i>	15
<i>Number</i>	20, 27, 36	<i>Refresh Button</i>	19
<i>Nw3000devicecommunicationalarmcondition</i>	10	<i>Remove</i>	28
<i>Nw3000devicestatusalarmcondition</i>	11	<i>Retrieve Field</i>	20
<i>Nw3000deviceversionalarmcondition</i>	11	S	
<i>Nw3000digitalalarmcondition</i>	11	<i>Set</i>	31
<i>Nw3000questionablealarmcondition</i>	11	<i>Set Digital Name</i>	32
<i>Nw3000realanalogalarmcondition</i>	11	<i>Set Digital Signal Check</i>	32
O		<i>Set Occurrence Time Check</i>	32
<i>Objects</i>	20, 34, 39	<i>Set Plant Area Check</i>	31
<i>Oeprinteralarmcondition</i>	12	<i>Set Priority</i>	31
<i>Oeprintergroupalarmcondition</i>	12	<i>Set Priority Check</i>	31
<i>OK Button</i>	29	<i>Signal</i>	25, 32, 33, 34, 38, 39, 40
<i>Options Button</i>	19, 33, 39	<i>Signal Dialog</i>	32, 38
<i>Options Dialog</i>	19, 39	<i>Signal Filter Grid</i>	33, 38
P		<i>Signal Filter Prompt</i>	34, 39
<i>Plant Areas</i>	31	<i>Signal List</i>	34, 40
<i>Play Sound</i>	36	<i>Signal Next Button</i>	34, 40
<i>Precedence</i>	23	<i>Signal Number</i>	34, 39
<i>Priority</i>	23, 31	<i>Signal OK Button</i>	34, 40
<i>Prompt</i>	20	<i>Signal Options Button</i>	33, 39
Q		<i>Signal Options Dialog</i>	34
<i>Questionable</i>	27	<i>Signal Refresh Button</i>	33, 39
<i>Questionable Mask Cancel Button</i>	28	<i>Sound</i>	24
<i>Questionable Mask Dialog</i>	26	<i>Sound Configuration Dialog</i>	36
<i>Questionable Mask OK Button</i>	28	<i>Sound Configuration Example</i>	36
		<i>Sound File</i>	36
		<i>Suppress</i>	24

Suppression Group 24, 28

Suppression Group Association Dialog 28

Suppression Group Button..... 28

T

Times..... 36

Token Pattern Matching..... 18

W

Wildcards..... 18

Reference Guide

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Alarm Condition Configuration

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